

PENDING CLAIMS

The following is a list of currently pending claims. Claims 9-11, 15, and 17-18 are cancelled. Please amend claims 1, 12-14, 16, and 19 as shown below.

1. (Currently amended) A method for making a semiconductor device, comprising:
providing a metal structure comprising tungsten on a substrate;
providing an insulating layer over the metal structure;
providing a capping structure over the insulating layer; and
annealing the resulting structure, wherein a portion of the metal structure has a width greater than about 1 micron.
2. (Original) The method of claim 1, wherein the substrate comprises a dielectric upper surface.
3. (Original) The method of claim 1, the capping structure comprising a substantially continuous layer.
4. (Original) The method of claim 1, the capping structure comprising a dielectric material.
5. (Original) The method of claim 4, wherein the dielectric material of the capping structure is PSG.
6. (Original) The method of claim 1, wherein the capping structure and annealing decreases peeling of the metal structure when heated.
7. (Original) The method of claim 1, including planarizing the insulating layer before providing the capping structure.
8. (Original) The method of claim 1, including annealing for about 30 to about 60 minutes at a temperature ranging from about 675 to about 700 degrees Celsius.

9.-11. (Cancelled)

12. (Currently amended) A method for making a semiconductor device, comprising:
providing a metal structure on a substrate, the metal structure comprising tungsten and a portion of the metal structure having a ~~dimension~~ width greater than about 1 micron; and
providing an insulating layer over the metal structure;
providing a capping structure over the insulating layer; and
annealing the resulting structure;
wherein the capping structure and annealing decreases peeling of the metal structure when heated.

13. (Currently amended) A method for making a semiconductor device, comprising:
providing a metal structure on a substrate, the metal structure comprising tungsten and a portion of the metal structure having a ~~dimension~~ width greater than about 1 micron; and
providing an insulating layer over the metal structure;
providing a capping structure over the insulating layer; and
annealing the resulting structure;
wherein the annealing decreases peeling of the metal structure when heated.

14. (Currently amended) A method for preventing peeling of a metal structure in a semiconductor device, comprising:
providing a metal structure comprising tungsten on a substrate;
providing an insulating layer over the metal structure;
providing a capping structure over the insulating layer; and
annealing the resulting structure, wherein a portion of the metal structure has a width greater than about 1 micron.

15. (Cancelled)

16. (Currently amended) A method for preventing peeling of a metal structure in a semiconductor device, comprising:

providing a metal structure on a substrate, the metal structure comprising tungsten and a portion of the metal structure having a ~~dimension~~ width greater than about 1 micron; and

providing an insulating layer over the metal structure;

providing a capping structure over the insulating layer; and

annealing the resulting structure;

wherein the annealing decreases peeling of the metal structure when heated.

17.-18. (Cancelled)

19. (Currently amended) A semiconductor device made by the method comprising:

providing a metal structure on a substrate, the metal structure comprising tungsten and a portion of the metal structure having a ~~dimension~~ width greater than about 1 micron; and

providing an insulating layer over the metal structure;

providing a capping structure over the insulating layer; and

annealing the resulting structure;

wherein the capping structure and annealing decreases peeling of the metal structure when heated.

20. (Withdrawn) A semiconductor device, comprising:

a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron;

an insulating layer over the metal structure; and

a capping structure over the insulating layer.

21. (Withdrawn) The device of claim 20, wherein the substrate comprises a dielectric upper surface.

22. (Withdrawn) The device of claim 20, wherein the capping structure comprises a substantially continuous layer.

23. (Withdrawn) The device of claim 20, the capping structure comprising a dielectric material.

24. (Withdrawn) The device of claim 23, wherein the dielectric material of the capping structure is PSG.

25. (Withdrawn) The device of claim 24, wherein the metal structure comprises tungsten.

26. (Withdrawn) The device of claim 20, wherein a portion of the metal structure has a dimension smaller than about 0.25 micron.

27. (Withdrawn) The device of claim 20, wherein the capping structure has been annealed.

28. (Withdrawn) A semiconductor device, comprising
a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron and another portion having a dimension less than about 0.25 micron;
an insulating layer over the metal structure; and
a substantially-continuous capping structure over the insulating layer.

29. (Withdrawn) The device of claim 28, wherein the capping structure has been annealed.

30. (Withdrawn) A memory device containing an integrated circuit comprising:
a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron;

an insulating layer over the metal structure; and

a capping structure over the insulating layer.

31. (Withdrawn) The device of claim 30, wherein the capping structure has been annealed.

32. (Withdrawn) A memory device containing an integrated circuit comprising:

a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron and another portion having a dimension less than about 0.25 micron;

an insulating layer over the metal structure; and

a substantially-continuous capping structure over the insulating layer.

33. (Withdrawn) The device of claim 32, wherein the capping structure has been annealed.

34. (Withdrawn) An electronic device containing an integrated circuit comprising:

a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron;

an insulating layer over the metal structure; and

a capping structure over the insulating layer.

35. (Withdrawn) The device of claim 34, wherein the capping structure has been annealed.

36. (Withdrawn) An electronic device containing an integrated circuit comprising:

a metal structure on a substrate; a portion of the metal structure having a dimension greater than about 1 micron and another portion having a dimension less than about 0.25 micron;

an insulating layer over the metal structure; and

a substantially-continuous capping structure over the insulating layer.

37. (Withdrawn) The device of claim 36, wherein the capping structure has been annealed.

AMENDMENTS TO THE CLAIMS: DISCUSSION

Claim 1 has been amended to recite a method for making a semiconductor device, comprising: providing a metal structure comprising tungsten on a substrate; providing an insulating layer over the metal structure; providing a capping structure over the insulating layer; and annealing the resulting structure, wherein a portion of the metal structure has a width greater than about 1 micron.

Claim 1 has been amended to include the limitations of original claims 9 and 10, which have been cancelled. The word "dimension" in original claim 10 was changed to "width". Support for this amendment is found in paragraph [0005].

Claims 12, 13, 16, and 19 also all previously included the limitation that a metal structure has a "dimension greater than about 1 micron." Each of these claims has been amended to recite a "width" rather than a "dimension". Support for this amendment is similarly found in paragraph [0005].

Claim 14 has been amended to include the limitations of claims 9 and 15. Claim 15 has been cancelled.